In this matter Mr. Lister's caution may, perhaps, be commended. In his arrangement of the Malacostraca, Dr. Calman adheres to his published views, in agreement with Boas and Hansen, splitting up the old order Schizopoda, so that the Mysidacea, with their reduced carapace, developed brood-pouches, and elongate tubular heart, are grouped with the Cumacea, Isopoda, Amphipoda, &c., in a division Peracarida, while the Euphausiacea are associated with the Decapoda to form the division Eucarida, characterised by an extensive carapace, a condensed heart, and the absence of brood-pouches. Mr. Lister, on the other hand, retains the order Schizopoda in its familiar signification. Here he clings to a position that must ultimately be abandoned, and he has little, except the opinion of Claus, to offer in its defence.

As might have been expected by those who have followed his excellent work, Dr. Calman's volume is especially strong in the morphological and systematic aspects of carcinology, while Mr. Lister deals more fully with development and bionomics. For example, we find in the latter author's chapter a summary of Keeble and Gamble's recent important work on colour-changes in the Decapoda, which has no place in Dr. Calman's volume. In both accounts of the Crustacea due regard is given to palæontology, and Mr. Lister appreciates no less than Dr. Calman the great importance of the Tasmanian Anaspides and its Palæozoic allies. By a judicious use of the two works, no student can fail to gain an admirable introduction to the study of the Crustacea.

Prof. Sedgwick has himself written the chapters on the Onychophora and the Myriapoda included in his volume. His epoch-making work on the structure and development of the Cape species of the former class might have prepared us for the excellence of his descriptions. In spite of Goodrich and Lankester's recent teaching on cœlomoducts, he still calls the peripatid excretory tubes "nephridia," a piece of conservatism in which he may find support from some zoologists; but it is hard to understand his rejection of the generic distinctions in the group, introduced by Pocock, and supported and extended by Bouvier, Dendy, and other recent workers. Except for Evans's Eoperipatus, he refuses to use the terms of these authors even in a subgeneric sense, needlessly coining a series of uncouth zoogeographical compounds such as "Chilio-peripatus," "Congo-peripatus," and "Capo-peripatus."

The unattractive yet interesting groups of Arthropoda known as "Myriapods" are dismissed in thirty pages. It is a matter for regret that the unnatural "Class Myriapoda" is retained, and in the discussion wherein the author defends this arrangement he does not even mention the natural solution of the difficulty —to treat the Chilopoda, Symphyla, and Diplopoda as independent classes—though he rightly insists on the insectan affinities of the Symphyla.

Mr. A. E. Shipley contributes a good chapter on the Insecta to Prof. Sedgwick's volume, giving a trustworthy account of the main structural features, and a clear, if brief, introduction to insect embryology, though the general discussion of metamorphosis is disappointingly curtailed. The denial of evidence for pre-Carboniferous insects ignores the ephemeroid and other remains described by Scudder from the American Devonian. Mr. Shipley's classification of insects is modified from Sharp's recent scheme; its only serious fault is the presence of the unnatural group "Anapterygota," including the Mallophaga, Anoplura, and Siphonaptera. In the account of the Apterygota, the two very remarkable genera, Anajapyx and Acerentomon (the latter regarded as the type of a new order), recently described by Silvestri, and the systematic work of Börner on the Collembola, should not have been neglected. In the description of the Lepidoptera, attention should have been directed to the importance of larval and pupal stages in the classification of the order, as pointed out by Chapman and others; from the statement on p. 710 it might be inferred that no lepidopterous pupa emerges partially from its cocoon.

The last chapter of the volume, occupying 90 pages, is devoted to the Arachnida. For this also, except a section on the Xiphosura by Mr. Lister, we are indebted to Mr. Shipley. The Pycnogonida, which appear as a subclass of the Arachnida, are too briefly dismissed; no reference is given to the works of Sars, Meinert, and Cole, nor is there any allusion to the puzzling ten-legged Antarctic genera; but the account of the Xiphosura and Eurypterida is especially good. The scorpions, spiders, and mites are excellently described, while the fairly full accounts of the Phalangidea and Palpigradi are welcome. The Tardigrada and Pentastomida appear as "appendices" to the Arachnida.

It is easy in reviewing such volumes to point out omissions, if not errors, and to suggest how this or that feature might be better otherwise. But the leading thought with which one lays them down is of gratitude to the authors for the labour expended on them and on the other volumes of the series to which they belong. With the yearly increasing output of research, the trustworthy text-book becomes more than ever necessary, and the modern English student is fortunate with sets of "Lankester" and "Sedgwick" on his shelves. G. H. CARPENTER.

THE FLORA OF THE PRESIDENCY OF BOMBAY.

The Flora of the Presidency of Bombay. By Dr. Theodore Cooke. Vol. ii., parts ii. to v. (London: Taylor and Francis, 1907–8.)

THE appearance of the last part of the second volume of the above completes the first instalment of the series of local floras projected to carry on the task of which "The Flora of British India," by Sir Joseph Hooker, aided by other eminent botanists, forms the foundation. The object of these "local" (or, as they might well be styled, provincial) floras is to amplify and, where necessary, to revise for a particular area the taxonomic information set out in the more general publication, and the present volume, judged in this light, must be held to have attained a high standard both in fulness and precision.

The descriptions, although answering the severest

technical requirements, are sufficient to guide even a beginner, and this is attained, among other means, by the inclusion of the whole account in a single paragraph, in place of the old plan of subjoining to an often curt diagnosis, sometimes barely intelligible without special study of the family or genus, a more or less loosely constructed note, usually in small print, on sundry features of the species, which might or might not, as things fall out, fulfil the end of a detailed description.

Another commendable feature of the work is presented in the analytical keys that are prefixed to the larger or more difficult genera. There is nothing easier, in a way, for a systematic writer than to make such a key on paper, and the more easily it has been made the more likely is it to be found in practice unworkable, or worse than useless; but the keys in this instance have been manifestly framed with some regard to the natural groupings of the species, and are clearly the result of personal and accurate examination of the material. As illustrations we may mention the synopsis at pp. 98–9 of the Bombay species of Diospyros, of Cordia (p. 199), Strobilanthes (pp. 365–6), and of the often almost hopeless genera of grasses (in the stricter sense). For the last-named very important family—the despair almost of taxonomists—Dr. Cooke has followed rather closely the arrangement made by Dr. Otto Stapf in the "Flora Capensis," which is that most generally now adopted, and, whatever may be thought of this as a comprehensive scheme for this difficult family, it must be admitted that Dr. Cooke's treatment of such genera as Panicum and Eragrostis, to say nought of Andropogon, has been fitted to it in a very workmanlike and skilful manner, without sacrificing detailed observations of the actual structure of the species, that are palpably the fruit of indefatigable work with the lens, by the author.

A like scrupulous accuracy pervades the nomenclature throughout the volume, though in some cases whole-hearted disciples of the Vienna Congress will miss sundry emendations that have doubtless been avoided purposely, for reasons analogous to those that have dictated, in the preparation of these Indian and colonial floras, adherence to the "Genera Plantarum" of Bentham and Hooker, as against the more recent work of Engler and Prantl. In the case of compendia founded, as the present is expressly, on the "Flora of British India," this is practically unavoidable, but in the analysis of families, and in some minuter matters, Dr. Cooke has shown, if anything, a shade too much deference to those monumental authorities. Take, for example, the arrangement of the tribes and subtribes in Compositæ (pp. 1–6). Assuming that Astereæ can be kept up as a tribe apart from Inuleæ, and that both should continue, even in a linear arrangement, to stand far apart from Senecionideæ through the intercalation of Helianthoideæ, Helenoideæ, and Anthemideæ, surely it is time to revise the subtribes of Astereæ. No doubt the solitary representative of the genus Erigeron found in Dr. Cooke's area, if it should be kept as an Erigeron at all, conforms to the definition of the subtribe "Heterochromeæ" by G. Bentham; but discoveries by the Abbé Delavay, by Wilson, and others in the Indo-Chinese region have shown that there are true Asters, and perhaps members of the allied genus Erigeron, that have the disk florets of the same bluish tint as the ligules, though of deeper intensity. In the "Genera Plantarum" it was admitted that in several genera all the florets are yellow, but now that the converse exception is known to affect the type-genus of the tribe, the division into Heterochromeæ and Homochromeæ seems to call for reconsideration.

A minor case suggests itself at pp. 1030–31, where the careful work of Jaubert and Spach on the actual forms of Melanocenchris has been swamped for the sake of resuscitating Koenig's practically barren title for the genus (Gracilea). This, of course, is a debatable example, but the same can hardly be said for the citation of Linnæus at p. 479 for the genus Boerhaavia, which Linné himself was most careful to attribute to its real author, Vaillant. In restoring *B. diffusa*, Linn., to the rank of a variety, Sir Joseph Hooker had, in fact, given the clue, because one or other of the two forms put under *B. repens* in the "Species Plantarum" was the type of Vaillant's genus. Whether either of those be identical with the *B. diffusa* of Linné can be decided only by inspection of the authentic types collected in Abyssinia by Lippi.

Dr. Cooke's "Flora" was commenced in 1900, and the first part appeared in July, 1901. On May 1, 1902, the Bombay herbarium at the Poona College of Science was destroyed by fire, and he has since had to depend largely on his own collections and those of Woodrow to supplement the classical material at Kew. He has examined and described 2502 indigenous species, and dealt with more than 500 introduced or cultivated plants known to the Presidency, distributed among 1029 genera and 148 families, embracing types of widely divergent affinities, and belonging to such diverse phytogeographical regions as the Oriental, East African, and Indo-Malayan. It is no mean achievement in itself to have completed such a task successfully. The final part is accompanied by a carefully prepared index to the book as a whole, and this is in two parts, the vernacular names being indexed by themselves, which, for most purposes, is the most convenient arrangement.

THE TEACHING OF PHYSICAL CHEMISTRY.

(1) *The Elements of Physical Chemistry.* By Prof. J. Livingston R. Morgan. Fourth edition, revised and enlarged. Pp. xiv+539. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1908.) Price 12*s.* 6*d.* net.

(2) *Outlines of Physical Chemistry.* By Dr. George Senter. Pp. xvii+369. (London: Methuen and Co., n.d.) Price 3*s.* 6*d.*

(1) THE fact that the former of the above-mentioned text-books has, in the space of a single decade, passed into its fourth edition, is sufficient evidence that the work has met with a large share of approval, and has shown it to be adapted to the requirements